

CLAIMS:

1. An apparatus for die attachment onto a substrate including non-metallic material, and metallic material that is adapted to receive a die having a eutectic coating, comprising:
 - a heating conduit through which the substrate is movable for heating the metallic material to a eutectic bonding temperature to facilitate bonding between the die and the metallic material at a die-attach position; and
 - an induction heating device at the die-attach position for heating the metallic material to the eutectic bonding temperature.
2. An apparatus according to claim 1, including a non-metallic support surface for the substrate at the die-attach position.
3. An apparatus according to claim 2, wherein the non-metallic support surface is made of ceramic material.
4. An apparatus according to claim 1, wherein the induction heating device comprises an induction coil comprised of a metal coil with single or multiple windings.
5. An apparatus according to claim 1, wherein the power output of the induction heating device is 10 kilowatts or less.
6. An apparatus according to claim 1, wherein the induction heating device is operated at a frequency of 10 megahertz or less.
7. An apparatus according to claim 1, including one or more induction heating devices located outside the die-attach position where induction heating takes place.
8. A method for attachment of a die having a eutectic coating to a substrate including non-metallic material, and metallic material adapted to receive the die, comprising the steps of:

providing a heating conduit;

heating the metallic material in the heating conduit to a eutectic bonding temperature to facilitate bonding between the die and the metallic material at a die-attach position while moving the substrate through the heating conduit;

heating the metallic material by induction heating means to the eutectic bonding temperature at the die-attach position; and

attaching a die to the metallic material at the die-attach position.

9. A method according to claim 8, including the step of maintaining the temperature of the metallic material below a glass transition temperature of the non-metallic material prior to induction heating at the die-attach position.

10. A method according to claim 9, including the step of maintaining the metallic material at the eutectic bonding temperature for a sufficient period of time for bonding the die to the metallic material, but before the non-metallic material is heated to above its glass transition temperature.

11. A method according to claim 9, wherein the rate of heating the metallic material from below the glass transition temperature to the eutectic bonding temperature is substantially higher than the rate of heating it from an ambient temperature to below the glass transition temperature.

12. A method according to claim 9, including the step of cooling the metallic material to a temperature that is below the glass transition temperature of the non-metallic material after attachment of the die at the die-attach position.

13. A method according to claim 12, wherein the rate of cooling the metallic material from the eutectic bonding temperature to below the glass transition temperature is substantially higher than the rate of cooling the metallic material from the glass transition temperature to an ambient temperature.

14. A method according to claim 8, wherein the induction heating means comprises an induction coil comprised of a metal coil with single or multiple windings.

5 15. A method according to claim 8, including supporting the substrate with a non-metallic support at the die-attach position.

16. A method according to claim 15, wherein the non-metallic support is made of ceramic material.

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17. A method according to claim 8, including heating of the metallic material by induction heating means outside the die-attach position where induction heating takes place.